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ABSTRACT

This paper summarizes Chapter XI, "An Overview and a Projection" of the book "Educational Evaluation and Decision-Making." The major assessments of this chapter: (1) how good were the answers provided to older questions; (2) what new questions were now able to be raised; and (3) who might be in a position to deal with them, are discussed. Concerning the first point, the author sees the book as more than passably adequate in terms of meeting its objectives, meeting the criteria for a good evaluation, responding to the five basic problems of evaluation, and meeting the conditions for an adequate theory. Regarding new questions, the areas of decision-making, criteria, methodology of the interface role, methodology of the technical role, data systems, implementation and organization, training, and therapy, are seen as those most in need of inquiry and development. Finally, in relation to who might deal with these questions, the author includes an eight page quotation from the book manuscript to discuss this topic. It suggests that evaluation practitioners on the local, state and national levels, evaluation consultants, evaluation research and development personnel, users of evaluation reports, consumers of evaluation reports, related professional groups and funding agencies might contribute solutions to new questions. (AG)

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A LOOK TO THE FUTURE

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THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

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A Paper Read As Part of the "Report of the Phi Delta Kappa National Study Committee on Evaluation," a Symposium of the National Meeting of the American Educational Research Association, New York, February, 1971. The paper summarizes Chapter XI, "An Overview and a Projection," of the Study Committee's volume, Educational Evaluation and Decision-Making, to be published early in 1971.

The book which we have been summarizing here today is obviously a beginning and not an end. The authors regard it as the first step in a continuing inquiry into evaluation, and we are sure that you will agree with that judgment should you dip into the book yourself. I have found it useful to think of knowledge as forming a sphere, with all of the unknown forming the "space" around the sphere. As knowledge grows, the sphere enlarges, but as it enlarges, it comes into contact with more and more of the unknown. So it is with this book. As a result of the inquiry we have conducted we have answered a few questions that we were able to raise given the state of our thinking three years ago. But we have raised more questions than we have answered as our knowledge enlarged.

The last chapter of our book, which it is my task to recapitulate today, tried to make two major assessments: (1) how good were the answers that we provided to our older questions, and (2) what new questions were now able to be raised and who might be in a favorable position to deal with them? I shall also deal with each of these assessments in my summary.

How Good are Our Answers to the Older Questions?

We suggest in the book that there are at least four ways to deal with this question:

1. How well were the objectives that were set for the book actually met? These objectives were the following:

    a. To expose five problem areas of evaluation: definition, decision-making, values and criteria, levels, and the research model.

b. To identify and assess extant or emergent formulations that might be used in conceptualizing solutions to these five problems, and to fashion them into tentative solutions.

c. To synthesize a new definition and methodology of evaluation that builds upon the products of (b).

d. To provide some operational guidelines for implementing and proposed new approach in terms of personnel, organization, and administration.

Our conclusion: the objectives were met in the sense that they were all dealt with, but this leaves open the question of how well they were dealt with. No doubt the reader will have reservations on this point, as do the authors. But regardless of these reservations, the book asserts that "the only real question . . . is whether the objectives have been met well enough to warrant attempts to implement the proposed model. If the model has sufficient face validity to meet this challenge, the reservations will either disappear, or be confirmed, as empirical data and experience mount." The authors conclude finally on this point that "they have made a sufficient case to warrant this next step," i.e., implementation efforts.

2. Meeting the criteria for an evaluation. The book outlines eleven criteria which a good evaluation must be able to meet, and so it seems proper to ask whether an evaluation designed on the principles outlined in the book can be expected to meet these criteria any more satisfactorily than could an evaluation designed on more "classic" principles.

On the scientific criteria of internal validity, external validity, reliability, and objectivity, there is some good news and some bad. Internal validity, it is asserted, may well be enhanced because of the existence of context data that provide an excellent

baseline measure, because the emphasis on invited interference eliminates laboratory antisepsis, and because process data are available to investigate instances in which internal validity might be suspect. External validity is considerably enhanced, it is suggested, both because real world situations are emphasized and because process data provide insights about the conditions under which the findings are applicable. On the other hand, reliability may suffer because certain relatively unreliable data sources are still considered admissable (e.g., testimony and other self-reports), although it should be noted that the use of many different data sources provides cross-check possibilities that are often absent under more controlled conditions. Similarly objectivity may suffer because of the wide range of information admissable, but cross-check possibilities also exist. The authors conclude about the scientific criteria that "on balance, the proposed evaluative approach does not suffer by comparison and in some particulars offers advantages of considerable significance."

It is on the practical criteria that the proposed approach really shines, however, and this is not surprising, since in a sense it was designed specifically with these criteria in mind. Relevance, importance, scope, and credibility are all assured, the authors assert, because of the interface relationship between the evaluator and the decision maker. Timeliness is well served because of the proactive posture of the CIPP model, as assured by the delineating steps. Pervasiveness is likewise assured by the interface provisions. The authors conclude, "When assessed in terms of its capability for providing evaluations that measure up well on the six practical criteria, one must conclude that the proposed approach has a great deal to warrant it."

A final prudential criterion of efficiency is also invoked on which the proposed approach, the authors warn, might well suffer unless great care is exercised. A full-scale system of the sort called for by the CIPP model cannot be justified on the basis of a few decisions to be served. The cost of servicing the decision might well exceed the cost of implementing it. The authors suggest that extreme caution should be employed until more empirical data are in concerning the real costs involved.

3. Responding to the five basic problems of the book. The book suggests that there are five major problems with current evaluation, and defines these as the problem of definition, the problem of decision-making, the problem of criteria and values, the problem of levels, and the problem of the research model. The question is raised whether the new formulations have any utility "in ameliorating or overcoming these problems."

Generally speaking these problems are seen as reasonably well handled. A new definition is proposed which avoids many of the problems of older definitions, which enlarges the concept of evaluation, and assigns it a more central role in organizational processes. The problem of decision-making is perhaps best handled because the new formulation is precisely designed to relate evaluation to decision-making. The problem of criteria and values is addressed directly but while important steps are made, the theory is by no means fully or finally developed on this point. The problem of levels is at least well illuminated in that the decisions made at different levels are seen to require different information and hence different (not merely aggregative) evaluations. Finally, the problem of the research model is least well handled in that, while the

problem is well delineated, very few solutions are proposed.

4. Meeting the conditions for an adequate theory. Since what is proposed in the book is, in a sense, a new evaluation theory, it is useful to ask to what extent the formulations meet general requirements for theoretical adequacy. This difficult philosophical question is by no means systematically handled but a minimal attempt is made to show that the formulations of the book are coherent, i.e., make it possible to reformulate or account for other theoretical statements about evaluation; that they are internally consistent; that they are comprehensive, in the sense of forming a complete system; that they are reasonably well able to generate testable hypotheses; that they can generate good operational designs; and that they provide a general guide for a wide range of educational evaluation problems. On balance the proposed formulations meet general theoretical criteria reasonably well.

When viewed in terms of these four ways of assessing the adequacy of the proposed formulations, i.e., meeting the book's objectives, meeting the criteria for a good evaluation, responding to the five basic problems, and meeting the conditions for an adequate theory, the book is seen as more than passably adequate, although certainly far from perfect. The answers to the older questions, in short, are not too bad.

What are Some of the New Questions Raised by the Book?

I quote from the book:

> This book is a culminating experience for its seven authors because it is the end product of years of individual thinking about evaluation and of many months of group debate, reassessment, and compromise to accommodate our several points of view. We believe that the product is

> as good as we can make it at this time. But precisely because we have thought about it so much, and haggled so long over its every detail, no one is more aware, or more acutely appreciative, of its shortcomings than we. It seems appropriate to us, following our own tenets, that we should conduct a kind of context evaluation, concerned with assessing the present status of the emergent theory and with identifying the needs, problems, and opportunities that still confront us, and others who may wish to join in . . . .

The last chapter then goes on to describe eight areas of need, problems, or opportunities: (1) decision-making, (2) criteria, (3) the methodology of the interface role, (4) the methodology of the technical role, (5) data systems, (6) implementation and organization, (7) training, and (8) therapy. These are the areas which the authors assert are most in need of inquiry and development if the theory proposed here is to be pushed ahead in productive fashion.

1. Decision-making. Two major problems are seen here. The first deals with the adequacy of the theoretical formulations proposed in the book. The authors write that "it has been a source of great concern . . . that they have not been able to identify an existing theory of decision-making that has permitted a heuristic application to the evaluation problem. The writing on decision-making . . . has been 'manufactured' by the authors," rather than adapted from existing formulations. This is a most serious deficiency since, as the authors state, their "own lack of expertise in the area gives them pause about so cavalier an action."

A number of formulations were devised by the authors to fill this gap. These include concepts about the decision process (awareness, design, choice, and action); about decision settings (metamorphic, homeostatic, incremental, and neomobilistic); about

decision models (disjointed incremental, synoptic, planned change, and others); and about decision types (planning, structuring, implementing, and recycling). Each of these formulations rests upon an ad hoc rationale generated in the writing, but these rationales may or may not be valid when analyzed from other conceptual or empirical points of view. Both conceptual and empirical critiques are urgently required.

The second problem in the area of decision-making has to do with the decision maker himself. As the book observes, the "lack of empirical information about real-world decision-makers is appalling." Most at issue is the question of whether decision-makers in fact act rationally. Second, there is the question of whether even rational decision-making must not take account of a whole series of non-rational elements, e.g., the political realities. The circumstances, the authors point cut, "argue against a purely rational decision-making model . . . . Obviously a better model, based on empirical information about real-world decision makers, is very much needed."

2. Criteria. Criteria are necessarily central to any formulation in which decision-making is such an important element, since decisions "are not made in a vacuum but always in relation to some explicit or implicit value structure." Four areas of difficulty are noted. First, the formulations of the book are again drawn up largely out of context to the literature on values, partly because the authors can claim little expertise in this area, but also because the "literature does not deal with value problems in a way that makes heuristic applications to the evaluation problem easy." Again close conceptual and empirical critiques are needed.

Second, the identification of criteria is seen as a lengthy and continuing interface problem. Decision-makers' values are not in every instance overt and well-appreciated. The decision-maker, like all humans, has difficulty in identifying his values; many remain hidden because of his lack of insight. Others will not be revealed because they constitute the decision-maker's "hidden agenda." Hence the evaluator faces a real dilemma: provide information on these little known or hidden values and risk censure or rejection, or fail to provide information and hence not service decisions adequately.

A third values problem lies in the fact that often more than one decision-maker (or at least, more than one legitimizing group) may be involved, so that values may be inconsistent, discontinuous, or even in conflict. "The question of which value structure to attend to and how to resolve the conflicts, inconsistencies, or discontinuities which exist must be dealt with."

Finally,"the evaluator must realize that value structures are dynamic--they change with time and circumstances . . . . This dynamic process itself requires study and theoretical explication."

3. The methodology of the interface role. The authors assert:

> A most glaring and conspicuous omission in this book is the failure to provide operational guidance for the evaluator as he plays /the/ interface role. Obviously the playing of it calls for a very sensitive interpersonal relationship. We have made the point in several places that it is this interface relationship that provides the greatest sanction for labelling the evaluator as a "professional," in the sense of a close, even privileged relationship with a client. If this relationship is so important why is it not dealt with in greater detail here? Just what does an evaluator do when he plays this role?

The answer to that question at this point in time is that mainly, we do not know. The mode of creating awareness, of spelling

out decision alternatives, of working out criteria, of "educating" a decision-maker, of reporting information productively, and of dealing with the inevitable questions of ethics and objectivity are largely unknown. Both conceptual and empirical explications are urgently required.

4. The methodology of the technical role. Devising a methodology appropriate to the technical roles of collecting, organizing, and analyzing data may, the authors assert, turn out to be even more difficult than devising a methodology for the interface role, for the latter is still an open question while it is often assumed that the former methodology is well understood and eminently teachable. But this is far from the true state of affairs, as much of the writing of the book seems to show. A whole new methodological approach based on assumptions other than those that undergird much of the conventional research methodology is needed. Many of these assumptions are inappropriate when the interest of the inquirer is in answering evaluative rather than research questions. Others are no longer necessary because of advances in technology, chiefly the computer. "The construction of a new general theory for collecting, organizing, and analyzing data will be a formidable task," the authors assert. "The analysis /of the book/ seems to indicate that it is possible but provides little insight into how it should be done."

Moreover, other technical advances will be required to augment the new theory when it is developed. New instrumentation, particularly instrumentation capable of handling classically "intangible" variables, will be needed. New theories of evaluative design will

be required. Unobtrusive measures will be needed, particularly in the area of process evaluation.

The authors conclude, "The task of devising suitable methodologies for the technical role will not be a simple one. The most competent statisticians, systems analysts, computer specialists, and the like will be required, and the challenge will be deserving of their best efforts."

5. Data systems. "The kind of evaluation that has been proposed here mandates the existence of data systems capable of handling the masses of information that will be required. These data systems will have to be capable of storing and retrieving not only large amounts of information but a number of varieties of information as well."

A context monitoring system may require including hundreds of different variables, each of which must be relatable to all others on a random basis. Not only will individual variables have to be stored and retrieved, but systems of variables as well, as for example, in the case of the alternatives that exist in response to some need, problem, or opportunity that a context evaluation has exposed.

Non-numerical data must also be available, in some cases in highly complex form. So for example, an input evaluator seeking to devise a new curriculum may want to know about the impact of information on motivation on his work. He wants this information not in the form of a bibliography of articles about motivation research but in the form of a set of pre-interpreted principles that he can directly apply.

Data systems capable of such feats of storage and retrieval will not be inexpensive, and this fact raises questions of economic feasibility. Probably consortia of agencies will need to be formed to place such a data system at the disposal of all educational agencies that might require it. How can such networks be formed and operated to produce maximum effectiveness and efficiency?

The authors conclude their discussion of data systems with the following observation:

> Unless these questions can be satisfactorily answered within the bounds of resources that it is sensible to commit to these purposes, the kind of evaluation system projected in this book is simply not feasible. This does not mean that no evaluation can take place until such facilities are available; it does mean that if the evaluation system is to have utility and the payoff contemplated it must ultimately rest upon an adequate data system.

6. Implementation and organization. The book does contain several case studies of existing organizations that are making an effort to operationalize the model of the book. But, the authors note,

> . . . the reader has no doubt already discovered the acute shortcomings of these formulations; anyone who searches these chapters for help in setting up his own evaluation unit will find only a few rules of thumb, some incomplete case descriptions that illustrate more the fact that units can be established rather than how to go about doing it, and a few exhortations.

A number of steps are called for by the authors to provide the kind of practical help that is needed. These include: carrying out a wide variety of more scientifically based case studies to provide a sound empirical basis for organizational decisions; devising general strategies that take account of the differing circumstances that inhabit different decisions settings (e.g., incremental strategies for situations in which a go-slow approach is counseled and

neomobilistic strategies where an all-out effort is possible); and devising appropriate tactics in support of each type of general strategy, e.g., tactics appropriate to staffing, budgeting, staff morale, and similar administrative questions.

7. Training. The authors observe that "it may well be the case that the lack of trained personnel to carry out evaluations . . . is the single biggest stumbling block that confronts the profession . . . . The problem has both quantitative and qualitative aspects. Very few trained evaluators exist and few are being trained by present means. Moreover, those who have been trained or are being trained are, in the main, 'traditional' evaluators . . . ."

There is little reason to hope that this problem will soon be ameliorated, for there are simply no programs that will do an adequate job of training. Perhaps the best evidence for this statement is the fact that those persons functioning in the field as evaluators tend not to turn to universities for training but are content "to train themselves through private reading, attendance at occasional and short term evaluation workshops, etc. Universities are certainly not inundated with large numbers of applicants. . . .

Why do these programs not exist? The authors suggest several answers and thereby imply the range of development work that is necessary if this problem is to be eliminated. There is first of all almost no agreement on what is an adequate role definition for an evaluator. Both adequate conceptual formulations and good empirical data about actual role expectations are lacking. There is, further, almost complete lack of experience with the interface and the administrative roles of the evaluator, as defined in the book. Professorial staff competent to man training programs are themselves in critically short supply. Training

materials, even in the sense of conventional text books, are lacking. Finally, there is a lamentable lack of resources, particularly federal resources, for attacking the problem.

8. Therapy. The term "therapy" is used to coincide with a recurrent metaphor used in the book, which is that of evaluation's "illness." Indeed, the book begins with a listing of certain "symptoms" of that illness, and it is to the amelioration of these symptoms that therapy is required. The authors assert that "symptoms disappear when illnesses are cured, and we may confidently assume that if better evaluations become possible, that /the symptoms of evaluation's illness/ will also disappear. But that will take time. . . . Is there nothing that can be done to provide at least some symptomatic relief in the interim? Can we not identify at least the equivalent of an antihistamine that will dry up our noses even if not curing our colds?"

The authors are able to make a few suggestions. The first is that we generally admit that evaluation is in fact "ill," to "clear the air and rid us of the need for foolish posturing." Second, we need to devise a strategy to reach the consultants who work with practitioners on evaluation problems, and who must therefore bear much of the responsibility for the current state of affairs. Third, we "need to make it more . . . rewarding to do reasonable evaluation." Fourth, we should "make it easier for local agencies that wish to engage in evaluations to do so, for example, by setting up evaluation service bureaus to render assistance. Finally, we must invest funds in long range planning that "will serve as a visible sign of commitment that we intend to do something about the evaluation problems that confront us. . . . Nothing comforts the patient more than some visible effort on the part of his physician . . . to cure him, even if he knows the cure will take a long time."

All of these efforts at therapy require design and development, as well as support, and we must turn some effort in this direction, the authors seem to assert.

These eight areas, decision making, criteria, the methodology of the interface role, the methodology of the technical role, data systems, implementation and organization, training, and therapy, provide the most immediate and pervasive challenges to be overcome if positive next steps are to be taken.

Who Can Effectively Participate in Taking These Next Steps?

I believe that this question is important enough to warrant my quoting the relevant sections of the book in their entirety. The remaining portion of this paper will thus be a full length quotation of pp. 523-530 of the mimeographed manuscript.

Who Should Participate in Resolving the Unresolved Issues?

There is certainly no existing group of professions whose training encompasses the many role behaviors that have been ascribed to evaluators in this book. Indeed, there is a great deal of question whether it is either possible or desirable to train a single person in all of these competencies; it might perhaps be more sensible to speak of a set of interlocking evaluator roles (e.g., interface and technical roles, to give an obvious instance) than a single evaluator role. Even if such a set is contemplated, however, the range of activities required to respond to all of the issues raised above, and to others which the reader may have detected, requires the cooperation and insight of a wider range of

professionals than could ever be subsumed under the simple evaluator rubric. The listing which follows despite its length is illustrative rather than exhaustive of this wider range.

We may distinguish at once between primary and secondary groups. Primary groups consist of individuals who are directly engaged either in the conceptualization or practice of evaluation. Secondary groups are those who use the results of evaluations or who can contribute ideas and tools that might be used by primary evaluators. Within each of these two groups a number of subgroups may be distinguished. The listing below provides some brief definitions and examples:

1. Primary groups

   A. Evaluation practitioners. These are the persons who actually design and carry out evaluations, and may range from highly technically oriented personnel such as instrument developers or computer programmers through highly client oriented personnel characterized here as "interface" personnel. Their major contribution typically is action. It is useful to distinguish further in terms of at least three levels (chiefly because of levels problem considerations):

      1. Local practitioners such as are found in local school districts, Title III projects, Head Start activities, and the like;

      2. State or regional practitioners, such as those in state departments of education, regional educational laboratories, interstate projects, and the like;

      3. National practitioners, such as those in the United States Office of Education, Project Talent, national assessment, and the like;

   B. Evaluation consultants. These are persons called in, either on an ad hoc or continuing basis, to assist in carrying out evaluations, to critique them (acting as evaluation "auditors"), or sometimes to take operational responsibility for some segment of the evaluation. Their major contribution typically is advice or help. It is again useful to distinguish three types on the basis of their parent organizations:

1. Practitioner organization based consultants, that is, consultants who themselves come from an organization much like the one they are advising, i.e., another local, state, regional, or national unit. These consultants are utilized mainly on the basis of their experience.

2. University based consultants. These consultants are typically utilized because of their technical expertise.

3. Private organization based consultants, often drawn from either profit or non-profit agencies that are in business to render service. Such consultants may have either experience or expertise (and often have both) but their chief utility seems to be their availability and their willingness to deal with the client's problems on the client's terms.

C. Evaluation research and development personnel. These are the persons who are engaged directly in the development of theories, models, paradigms, and the like intended to provide the conceptual basis for evaluation and/or the persons engaged in the development of instruments, designs, data processing techniques, and the like intended to provide the operational basis for evaluation. Their major contributions are thus ideas or tools. Again it is convenient to project three types:

1. Those based in education departments or schools in universities. Robert Stake (University of Illinois) and Marvin Alkin (UCLA) are examples.

2. Those based in universities but not in education units. Michael Scriven (University of California) and the late Edward Suchman (University of Pittsburgh) are examples.

3. Those based outside universities, often in practitioner organizations or private consultant or research firms. John Flanagan (AIR) and Wayne Wrightstone (New York City Schools) are examples.

11. Secondary groups

A. Users of evaluation reports. In the language of this book these are the decision-makers whose decisions are being serviced by the evaluation activities.

B. Consumers of evaluation reports. These are typically the publics or patrons of the organization or agency for whose decision-makers the evaluations were performed, and may include other members of the organization who are not decision-makers but are affected by the decisions made. In the former category we may mention such examples as parents, taxpayers, or special interest groups such as the American Legion. Examples of the latter category are teachers, pupils, or subcontractors and suppliers.

C. Related professional groups. Included in this category are a variety of relatively more basic sciences on which the relatively more applied science of evaluation may draw. Included are at least the following:

1. Measurement scientists and instrument development specialists
2. Statisticians
3. Computer science specialists
4. Systems analysts and operations researchers
5. Philosophers, especially value philosophers
6. Theorists in organization and administration
7. Communication theorists

D. Funding agencies. These are the foundations or governmental agencies that can support necessary research and development effort or can underwrite the extraordinary installation costs of evaluation systems.

What Can Each of These Groups Contribute?

It is obvious that each of these groups can make some particular contribution. Some groups have a greater stake in the matter and hence might be expected to contribute more; others may not see themselves as involved directly with evaluation but may nevertheless contribute a key idea, tool, or action. Each group brings a particular perspective and also a particular set of interests and competencies. What is probably most needed is a symbiotic relationship among the groups that will result in the potential contribution of each being utilized at the appropriate time and in the appropriate way. The major responsibility for effecting this symbiotic relationship clearly must be placed on the primary groups, and among them, on the research and development personnel who, on balance, would seem to have the greatest amount of time, the most institutional freedom, and the necessary intellectual scope to get the job done.

The question of what contribution should be made by each of the groups listed in the preceding section is probably best left to the discretion of each individual group; it would be presumptuous to attempt to guage the degree of commitment to the problem or the amount of insight that might be brought to bear by each. Some exemplary contributions are outlined in the accompanying Figure 1, however, to provide the flavor of what might be done. This figure indicates the various contributing groups and relates them to the eight areas of unresolved issues dealt with in Section 3 of this chapter. Example contributions are indicated by checks in the appropriate cells. It should be recalled that we are concerned here with the question of resolving issues or questions, not in engaging in significant activity in the cells in question.

So for example, local practitioners may very well be engaged in operational activities concerned with each of the eight cells; however, it seems unrealistic to expect them to contribute much toward resolving the question of an appropriate decision-making theory to service evaluation, or an appropriate interface methodology. Local practitioners might make significant contributions to the organization and administration dilemma, however, for they must devise some kind of organization. Experience with a variety of local units might give some insights into the most efficient or viable organizational patterns. This problem would be especially aided if local administrators would keep detailed case histories of the development of their units. Some local practitioners might similarly contribute to data systems; this cell has not been checked, however, on the assumption that most local evaluation units would not set up their own data storage and retrieval system but would instead engage in sharing with other units.

Contributing Groups	Unresolved Issues							
	Decision-Making	Criteria and Values	Interface Methodology	Technical Methodology	Data Systems	Organization and Admin	Training	Therapy
I. Primary Groups								
A. Practitioners								
1. Local						✓		
2. State or regional					✓	✓		
3. National					✓	✓		
B. Consultants								
1. Practitioner unit based					✓	✓	✓	✓
2. University based					✓	✓	✓	✓
3. Private unit based					✓	✓	✓	✓
C. Research and development pers								
1. University--education			✓	✓		✓	✓	
2. University--non-education	✓	✓	✓	✓		✓	✓	
3. Non-university	✓	✓	✓	✓	✓			
II. Secondary groups								
A. Users	✓	✓						
B. Consumers	✓	✓						
C. Related professionals								
1. Measurement-instrument				✓				
2. Statisticians				✓				
3. Computer specialists				✓	✓			
4. Systems analysts	✓	✓	✓					
5. Philosophers		✓	✓					
6. Organizational theorists	✓		✓			✓		
7. Communication theorists			✓	✓	✓			
D. Funding agencies	✓	✓	✓	✓	✓	✓	✓	✓

FIGURE 1: SOME EXEMPLARY CONTRIBUTIONS THAT MIGHT BE MADE TO THE UNRESOLVED ISSUES BY A VARIETY OF RELATED GROUPS.

Both state and national level practitioners might, on similar grounds, make significant contributions to data systems and organization. Accordingly these cells have been checked.

Consultants at all levels seem to be in a particularly useful posture in relation to the last four issue areas which seem to be more practice oriented than the first four. Thus they seem to be well able to provide advice to practitioners about data systems and organizational problems, and in turn to reflect problems encountered at the level of practice to the research and development personnel with whom they interact. Consultants are also able to provide training, particularly in the form of workshops or direct on-the-job instruction. Finally they seem to be in a very fortunate position with regard to providing therapy for the practitioners whom they contact.

Research and development personnel as noted above bear the primary responsibility for tying the whole system together. It is up to them to meld available ideas into coherent systems and to provide the basis for the tools, if not the tools themselves, that practitioners will use. All three kinds of R & D personnel displayed in Figure 1 can make contributions to interface and technical methodologies. The non-education R & D personnel are probably best able to deal with the decision-making and value areas. University personnel, in or out of education, can make primary contributions to training, including especially the development of training experiences and materials; they are probably also best equipped to deal with the organization-administration area. Finally certain kinds of non-university R & D personnel, e.g., those employed by data equipment manufacturers, can probably best deal with the data systems area.

Among the secondary groups, users and consumers can make a real contribution not so much in direct work on issue resolution but by making themselves available to R & D personnel in the areas of decision-making and value. These are the groups that make decisions (primary or secondary) and who implicitly or explicitly hold the values that become applied in the form of criteria. By making themselves available for study and by cooperating in exposing their own processes they can help enormously.

Each of the related professional groups relates well to one or two of the issue areas and can contribute ideas, insights, or tools that would help in their resolution. Measurement specialists and instruments builders are necessary in devising technical methodologies, as are statisticians. Computer specialists are also needed in this area but primarily, of course, in the data systems area. Systems analysts have much to say about decision-making, criteria, and particularly about interface methodology. Philosophers are needed to devise better approaches to the value area and to interface methodology. Organizational theorists illuminate decision-making, interface methodology, and of course organization and administration. Communication theorists can contribute both to interface and technical methodology and to the theory of data systems.

Finally, funding agencies have a vital role to play in every area, in underwriting research and development costs, in supporting agencies in institutionalization of the new evaluation, and in general lending their good name in the cause of better evaluation.